Section 10.3 Solving Quadratic Equations by the Quadratic Formula

# Objective 1: Using the Quadratic Formula

Any quadratic equation can be solved by completing the square. By completing the square for a general quadratic equation , we derive the **quadratic formula**.

Because the quadratic formula is derived by completing the square, it can be used to solve any quadratic equation written in standard form.

**Quadratic Formula:**

A quadratic equation written in the form has the solutions and .

Use the quadratic formula to solve the equation. Give the answers in exact form using simplified radicals as needed.

|  |  |
| --- | --- |
| a. | b. |

|  |  |
| --- | --- |
| c. | d. |

# Objective 2: Using the Discriminant

In the quadratic formula, the value of the radicand, , tells us the number of real solutions of the corresponding quadratic equation. This value is called the **discriminant.**

**Discriminant:**

For a quadratic equation of the form ,

* when , the quadratic equation has two real solutions.
* when , the quadratic equation has one real solution.
* when , the quadratic equation has no real solutions.

Use the discriminant to determine the number of real solutions of the quadratic equation.

|  |  |
| --- | --- |
| a. | b. |